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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/755,528

01/12/2004

Yoji Yamamoto

82478-4500

1298

21611

7590

09/22/2006

SNELL & WILMER LLP  
600 ANTON BOULEVARD  
SUITE 1400  
COSTA MESA, CA 92626

EXAMINER

HODGES, MATTHEW P

ART UNIT

PAPER NUMBER

2879

DATE MAILED: 09/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/755,528

Applicant(s)

YAMAMOTO ET AL.

Examiner

Matt P. Hodges

Art Unit

2879

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 June 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,5-13 and 15-21 is/are rejected.
- 7) ☒ Claim(s) 3,4 and 14 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Specification*

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 5-9, 11, 16 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Held (US 3,652,894).

Regarding claims 1, 2, 5-9, and 16, Held discloses (see figure 1) a cathode ray tube including an electron gun, where the electron gun further uses a cathode structure including a columnar electric insulating material body (7) a cathode unit (4) disposed at one end of the body, and a heater (6) embedded in and disposed at a second end of the body with leads extending from a side of bottom of the body (7). The cathode unit includes metal cup (1) and emission pellet (5) of an electron emitting material. The insulating material body is filled with an insulator around the heating element. The body further includes annular protrusions (sides of 7) that extend outward between the leads and the cathode. (Column 2 lines 5-20).

Regarding claims 11 and 18, Held further discloses the use of a ceramic (quartz) as the material for the electric insulating material body. (Column 2 lines 10-15).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Held (US 3,652,894).

Regarding claim 15, Held discloses the device as claimed (see rejection of claim 1 above) but does not appear to specify the use of a trapezoidal cross-sectional shape. However the applicant fails to identify the use of trapezoidal cross-sectional shape to solve any problem or yield any unexpected result that is not within in the scope of the teachings relied upon. It would have been an obvious design choice to one having ordinary skill in the art to change the cross sectional shape of the cathode to the trapezoid as claimed by the applicant, since such a modification would involve a mere change in the shape of the device and would not affect the overall operation of the device.

Claims 1, 2, 5-9, 11-13, 16, and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto et al. (US 6,300,711) in view of Held (US 3,652,894).

Regarding claims 1, 2, 5-9 and 16, Yamamoto discloses (see figure 1) a cathode ray tube including an electron gun, where the electron gun further uses a cathode structure including a columnar body (11) a cathode unit (8) disposed at one end of the body, and a heater (10)

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embedded in and disposed at a second end of the body with leads extending from a side of bottom of the body (11). The cathode unit includes metal cup (15) and emission pellet (9) of an electron emitting material. The body is filled with an insulator around the heating element. The body further includes protrusions (sides of 11) that extend outward between the leads and the cathode. (Column 2 lines 5-20). Yamamoto does not appear to specify the use of an insulating layer between the heating element and the outmost layer of the material body. However Held (see rejection of claim 1 above), in the same field of endeavor, discloses the use of an insulating layer coated along the inside of a metal outer body in order to advantageously improve electrical insulation between the heater wire and the cathode element. Thus, it would have been obvious at the time the invention was made to a person having ordinary skills in the art to incorporate the insulating material body layer as taught by Held into the device as disclosed by Yamamoto in order to advantageously improve electrical insulation between the heater wire and the cathode element.

Regarding claims 11 and 18, Yamamoto in view of Held further discloses the use of a ceramic (quartz) as the material for the electric insulating material body. (Column 2 lines 10-15).

Regarding claims 12, 13, 19, and 20, Yamamoto further discloses (see figure 1) the use of a metal support wires between the cathode and the insulating body that extend outwards from the center axis of the body. (See figure 1).

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Claims 10 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto et al. (US 6,300,711) in view of Held (US 3,652,894) and further in view of Rand et al. (US 5,105,456).

Regarding claims 10 and 17, Yamamoto in view of Held discloses the device as claimed (see rejection of claim 1 above) but does not appear to specify the use of Barium Oxide in the pellet. However Rand, in the same field of electron emission, discloses the use of barium oxide in the electron emitting pellet to advantageously lower the work function and operating temperature required for electron emission. (Column 11 lines 60-67). Thus, it would have been obvious at the time the invention was made to a person having ordinary skills in the art to incorporate the use of Barium Oxide in the cathode pellet as taught by Rand into the device as disclosed by Yamamoto in view of Held in order to advantageously lower the work function and operating temperature required for electron emission.

Claims 10, 17, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto et al. (US 6,300,711) in view of Held (US 3,652,894) and further in view of Lee. (US 5,451,831).

Regarding claims 10, 17, and 21, Yamamoto in view of Held discloses the device as claimed (see rejection of claim 1 above) but does not appear to specify the use of Barium Oxide covered with and Osmium-Ruthenium thin film in the pellet. However Lee, in the same field of electron emission, discloses the use of Barium Oxide covered with and Osmium-Ruthenium thin film in the electron emitting pellet to advantageously lower the work function and operating temperature required for electron emission. (Column 1 lines 45-55). Thus, it would have been

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obvious at the time the invention was made to a person having ordinary skills in the art to incorporate the use of Barium Oxide covered with and Osmium-Ruthenium thin film in the pellet as taught by Lee into the device as disclosed by Yamamoto in view of Held in order to advantageously lower the work function and operating temperature required for electron emission.

*Allowable Subject Matter*

Claims 3, 4, and 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 3, the references of the Prior Art of record fails to teach or suggest the combination of the limitations as set forth in claim 3, and specifically comprising the limitation of a cathode structure including a heater embedded into an columnar electric insulating body with a wall disposed around a perimeter of a bottom surface of the body. The bottom of the body rises in a dome shape inside the wall.

Regarding claim 4, the references of the Prior Art of record fails to teach or suggest the combination of the limitations as set forth in claim 4, and specifically comprising the limitation of a cathode structure including a heater embedded into an columnar electric insulating body with a part having a greater diameter than the bottom end surface of the body.

Regarding claim 14, the references of the Prior Art of record fails to teach or suggest the combination of the limitations as set forth in claim 14, and specifically comprising the limitation

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of a cathode structure including a heater embedded into an columnar electric insulating body where the heater wire is coiled into an S shape.

***Response to Arguments***

Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.



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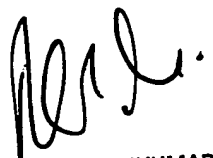
***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matt P Hodges whose telephone number is (571) 272-2454. The examiner can normally be reached on 7:30 AM to 4:00 PM M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on (571) 272-2457. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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NIMESHKUMAR D. PATEL  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800